

# METEOROLOGICAL EFFECTS ON AIRWAY INFLAMMATION AS MEASURED BY EXHALED NITRIC OXIDE

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**Background and Aims:** To study the effect of outdoor weather conditions on airway inflammation as measured by exhaled nitric oxide during summer month in Korea.

**Methods:** A total of 991 residents were tested the fraction of exhaled nitric oxide ( $FE_{NO}$ ), a non-invasive measure of airway inflammation during the summer month, August 8-30, 2005. Air pollution and meteorological parameters were obtained from a near ambient air monitoring station.

**Results:** The average outdoor temperature, relative humidity, and air pressure were approximately 27.3°C, 81.5%, and 1005.7 hPa, respectively during the study. The hourly average of meteorological concentration was matched with a  $FE_{NO}$  level on various exposure windows after adjusting for confounders including age, gender, smoking, cough, asthma, allergic rhinitis, bronchial hyper-responsiveness, skin prick, and air pollutants. Ambient temperature, relative humidity, and air pressure were associated with 7.8% (lag 39,  $p<.0001$ ), 7.8% (lag 8,  $p<.0001$ ), and 4.9% (lag 37,  $p=0.0169$ ) higher  $FE_{NO}$  levels over the inter-quartile range of 4.3°C, 20.2%, and 4.0 hPa, respectively. The relations of both air temperature and relative humidity with  $FE_{NO}$  appear graphically as a very wide U-like shape, and optimum air temperature and relative humidity with lowest  $FE_{NO}$  level are about 25-26°C and 60-70%, ranging from 18.0°C to 36.9°C and 32.1% to 99.5% in study month, respectively.

**Conclusions:** Adverse inflammatory reactions are expected for both below and above the optimum temperature and relative humidity. However, ambient weather conditions of the summer month in Korea should not have too much effect on airway inflammation as measured by  $FE_{NO}$  level.